

REMARKS

Overview of the Office Action

Claims 1-7 and 9-10 have been rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 4,935,665 ("Murata") in view of Japanese Patent Pub. No. JP2001085748 ("Kimura"), and further in view of US Patent Appl. Pub. No. 2003/0122247 ("Joshi").

Claim 8 has been rejected under 35 U.S.C. §103(a) as unpatentable over Murata in view of Joshi, and further in view of U.S. Patent No. 6,545,332 to Huang ("Huang").

Claims 11 and 12 have been rejected under 35 U.S.C. §103(a) as unpatentable over Murata in view of Joshi, and further in view of U.S. Patent Appl. Pub. No. 2002/0139987 ("Collins").

Status of the claims

Claim 1 has been amended.

Claims 1-12 remain pending.

Rejection of claims 1-7 and 9-10 under 35 U.S.C. § 103(a)

The Office Action states that the combination of Murata, Kimura, and Joshi teaches all of the elements recited in Applicants' claims.

Independent claim 1 has been amended to recite, a light source module that includes, "a metal carrier, a plurality of LEDs connected to the metal carrier in an insulating manner, a frame surrounding the plurality of LEDs, the frame comprising expansion joints, the expansion joints each comprising a separation cut, potting composition arranged between the frame and the plurality of LEDs, and a printed circuit board disposed between the frame and the metal carrier

for electrically connecting the plurality of LEDs, the printed circuit board being arranged to cover portions of the metal carrier; wherein the plurality of LEDs are connected to the metal carrier on regions of the metal frame that are not covered by the printed circuit board". Support for the claim amendment can be found in Fig. 1 of Applicants' specification.

Murata, Kimura, and Joshi, whether taken alone or in combination, fail to teach or suggest, (1) "a frame surrounding the plurality of LEDs, the frame comprising expansion joints, the expansion joints each comprising a separation cut" and (2) "a printed circuit board disposed between the frame and the metal carrier for electrically connecting the plurality of LEDs, the printed circuit board being arranged to cover portions of the metal carrier; wherein the plurality of LEDs are connected to the metal carrier on regions of the metal frame that are not covered by the printed circuit board", as recited in Applicants' amended claim 1.

Regarding the first limitation, the Examiner acknowledges that Murata and Kimura fail to disclose a frame having expansion joints with separation cuts. The Examiner alleges that Joshi discloses such expansion joints. However, Joshi merely shows a multi-layer substrate with multiple silicon dies arranged thereon (see first sentence of paragraph [0022] of Joshi). The substrate of Joshi includes layers 100, 102, and 104. Although Joshi refers to layers 100 and 104 as frames, these are part of the overall substrate. Chip packages 400 are arranged on the lead frame layer 104 with an array of solder balls attached to the upper or active surface (see lines 11-12 of paragraph [0024]). Furthermore, paragraph 0025 indicates that the layer 104 should be made of copper (see lines 6-7 of paragraph [0025]). Finally, the active surface of the layer 104 and the chip packages 400 with the array of solder balls is to be applied directly to a printed circuit board (PCB) (see lines 7-11 of paragraph [0021]).

In view of the above, Joshi does not disclose a frame as recited in the present invention. Rather, Joshi discloses a substrate and die (i.e., chip package) that is to be applied to a printed circuit board. Since, Joshi fails to teach anything about a frame arranged on printed circuit board or substrate, the combination of Murata, Kimura, and Joshi fails to disclose, teach or suggest “a frame surrounding the plurality of LEDs, the frame comprising expansion joints, the expansion joints each comprising a separation cut”, as expressly recited in independent claim 1.

Regarding the second limitation, the Examiner cites Fig. 7 (items 13, 15, and 16) and col. 3, lines 31-57 of Murata as teaching a printed circuit board arranged between a frame 4 and a metal carrier 12.

Murata discloses a light emitting diode lamp having an insulated metallic board 1 with a plurality of hollows 11 and a light emitting diode 2 mounted on the bottom of each hollow 11 (see col. 3, lines 25-29 of Murata). The insulated metallic board 1 consists of a metallic layer 12, an electrically insulating layer 13, pole patterns 15 and lead patterns 16 (col. 3, lines 32-41). The pole patterns 15, which are arranged on the electrically insulating layer 13, are used to electrically connect the LEDs 2.

Nowhere in Murata is it taught or suggested that the pole patterns 15, the lead patterns 16, and the electrically insulating layer 13 form a printed circuit board.

However, following the Examiner’s interpretation of Murata, if the electrically insulating layer 13, the pole pattern 15, and lead pattern 16 corresponds to Applicants’ recited printed circuit board, and the metallic layer 12 corresponds to Applicants’ recited metal carrier, the printed circuit board (elements 13, 15, and 16) of Murata completely covers the entire metallic layer 12.

In contrast to Murata, Applicants’ amended claim 1 recites that a printed circuit board is

disposed between the frame and the metal carrier for electrically connecting the plurality of LEDs, and the printed circuit board being arranged to cover portions of the metal carrier. Applicants' claim 1 further recites that the plurality of LEDs are connected to the metal carrier on regions of the metal frame that are not covered by the printed circuit board.

Further, a person skilled in the art would not be motivated to alter the device of Murata to form regions on the metal layer 12 that are uncovered by the "printed circuit board" (12, 15, 16), and connect LEDs to the uncovered regions because doing so would result in the LEDs being connected in parallel via the metal layer 12. However, Murata specifically discloses that the LEDs are connected in series (see col. 6, lines 27-28 of Murata).

Moreover, Kimura and Joshi also fail to teach or suggest, a light source module that includes, "a printed circuit board disposed between the frame and the metal carrier for electrically connecting the plurality of LEDs, the printed circuit board being arranged to cover portions of the metal carrier; wherein the plurality of LEDs are connected to the metal carrier on regions of the metal frame that are not covered by the printed circuit board", as recited in Applicants' amended claim 1.

In view of the foregoing, it is respectfully submitted that Murata, Kimura, and Joshi whether taken alone or in combination, fail to teach or suggest the subject matter recited in Applicants' amended independent claim 1. Accordingly, claim 1 is patentable Murata, Kimura, and Joshi under 35 U.S.C. §103(a).

Dependent claims

Claims 2-7 and 6-10, which depend from independent claim 1, incorporate all of the limitations of independent claim 1 and are, therefore, deemed to be patentably distinct over

Murata, Kimura, and Joshi for at least those reasons discussed above with respect to independent claim 1.

Rejection of claim 8 under 35 U.S.C. § 103(a)

The Office Action states that the combination of Murata, Joshi, and Huang teaches all of the elements recited in Applicants' claims.

As previously discussed, Murata and Joshi do not teach or suggest the subject matter recited in Applicants' amended independent claim 1.

Because Murata and Joshi do not teach or suggest the subject matter recited in amended independent claim 8, and because Huang does not teach or suggest the elements of claim 8 that Murata and Joshi are missing, the addition of Collins does not remedy the above-described deficiencies of Murata and Joshi.

Independent claim 8 recites limitations similar to amended independent claim 1 and is, therefore, patentable over Murata, Joshi, and Huang for reasons discussed above with respect to amended claim 1.

Rejection of claims 11-12 under 35 U.S.C. §103(a)

The Office Action states that the combination of Murata, Joshi, and Collins teaches all of the elements recited in Applicants' claims.

As previously discussed, Murata and Joshi do not teach or suggest the subject matter recited in Applicants' amended independent claim 1.

Because Murata and Joshi do not teach or suggest the subject matter recited in amended independent claim 8, and because Collins does not teach or suggest the elements of claim 8 that

Murata and Joshi are missing, the addition of Collins does not remedy the above-described deficiencies of Murata and Joshi.

Claims 11-12, which depend from independent claim 1, incorporate all of the limitations of independent claim 1 and are, therefore, deemed to be patentably distinct over Murata, Joshi, Joshi, and Collins for at least those reasons discussed above with respect to independent claim 1.

Conclusion

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of all rejections, and allowance of all pending claims in due course.

Should the Examiner have any comments, questions, suggestions, or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

Respectfully submitted,

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